

## CLAIMS

What is claimed is:

1. A method to operate a wireless network with a mobile station MS, comprising:

registering the MS with a correspondent node CN;

sending data from the CN to a Content Proxy Server identified by the MS; and

determining a current location of the MS with the Content Proxy Server, setting up a Point to Point Protocol PPP between the MS at its current location and the wireless network, and routing the data from the Content Proxy Server to the MS at its current location.

2. A method as in claim 1, where registering comprises sending a Network Access Identifier NAI of the MS and an Internet Protocol IP address of the Content Proxy Server to the CN from the MS, where the data sent from the CN to the Content Proxy Server includes the NAI, and where the Content Proxy Server determines the current location of the MS by sending a query to a home Authentication, Authorization and Accounting AAA server, the query comprising the NAI.

3. A method as in claim 1, further comprising, in response to detecting that the MS has changed its location in the wireless network, registering the MS with a base station BS to indicate the current location of the MS; and in response to the MS registering with the BS, triggering the sending of messages in the wireless network until information that is indicative of the current location of the MS is recorded by an Authentication, Authorization and Accounting AAA server, where the Content Proxy Server determines the current location of the MS by sending a query to the AAA server.

4. A method as in claim 1, further comprising, in response to detecting that the MS has changed its location in the wireless network, and that the MS is in an Idle state, sending a message from the MS to a base station BS, the message indicating the current location

of the MS; and triggering the sending of further messages in the wireless network from the BS to a Packet Control Function PCF, and from the PCF to a Packet Data Serving Node PDSN, and from the PDSN to an Authentication, Authorization and Accounting AAA server such that information that is indicative of a current BS/PCF/PDSN affiliation of the MS at the current location of the MS is recorded by the AAA server, where the Content Proxy Server determines the current location of the MS by sending a query to the AAA server.

5. A method as in claim 4, where the MS is identified at least in part by its International Mobile Subscriber Identity IMSI, and where the PDSN is identified by its Internet Protocol IP address.

6. A method as in claim 3, where detecting comprises receiving a sub-paging zone identifier with the MS, comparing the received sub-paging zone identifier with a previously received sub-paging zone identifier, and detecting that the MS has changed its location in the wireless network when the received sub-paging zone identifier does not match with the previously received sub-paging zone identifier.

7. A method as in claim 3, where the information comprises a sub-paging zone identifier SPZ\_ID, a paging zone identifier PZID, and an Internet Protocol IP address of the PDSN.

8. A method as in claim 7, where querying the AAA server is performed in response to an occurrence of a network initiated data session NIDS for the MS, and where the AAA server returns at least the SPZ\_ID, PZID and PDSN IP Address that are recorded for the MS.

9. A method as in claim 4, where detecting comprises receiving a sub-paging zone identifier with the MS, comparing the received sub-paging zone identifier with a previously received sub-paging zone identifier, and detecting that the MS has changed its location in the wireless network when the received sub-paging zone identifier does not match with the previously received sub-paging zone identifier.

10. A method as in claim 4, where the information comprises a sub-paging zone identifier SPZ\_ID, a paging zone identifier PZID, and an Internet Protocol IP address of

a Packet Data Serving Node PDSN.

11. A method as in claim 10, where querying the AAA server is performed in response to an occurrence of a network initiated data session NIDS for the MS, and where the AAA server returns at least the SPZ\_ID, PZID and PDSN IP Address that are recorded for the MS.

12. A wireless network comprising a mobile station MS operable for registering the MS with a correspondent node CN, said wireless network coupled to a Content Proxy Server, said CN sending data to said Content Proxy Server that is identified by the MS when registering with the CN, said Content Proxy Server operating to determine a current location of the MS and to initiate setting up a Point to Point Protocol PPP between the MS and the wireless network at its current location and to route the data from the Content Proxy Server to the MS at its current location.

13. A wireless network as in claim 12, where registering comprises sending a Network Access Identifier NAI of the MS and an Internet Protocol IP address of the Content Proxy Server to the CN from the MS, where the data sent from the CN to the Content Proxy Server includes the NAI, and where the Content Proxy Server determines the current location of the MS by sending a query to a home Authentication, Authorization and Accounting AAA server, the query comprising the NAI.

14. A wireless network as in claim 12, where said MS is further responsive to detecting that the MS has changed its location in the wireless network to register said MS with a base station BS to indicate the current location of said MS; and said wireless network, in response to the MS registering with the BS, triggering the sending of messages in the wireless network until information that is indicative of the current location of the MS is recorded by an Authentication, Authorization and Accounting AAA server, where the Content Proxy Server determines the current location of the MS by sending a query to the AAA server.

15. A wireless network as in claim 12, where said MS is further responsive to detecting

that the MS has changed its location in the wireless network, and that the MS is in an Idle state, to send a message to a base station BS, the message indicating the current location of said MS; and said wireless network, in response to the MS registering with the BS, triggering the sending of further messages in the wireless network from the BS to a Packet Control Function PCF, and from the PCF to a Packet Data Serving Node PDSN, and from the PDSN to an Authentication, Authorization and Accounting AAA server such that information that is indicative of a current BS/PCF/PDSN affiliation of the MS at the current location of the MS is recorded by the AAA server, where the Content Proxy Server determines the current location of the MS by sending a query to the AAA server.

16. A wireless network as in claim 15, where the MS is identified at least in part by its International Mobile Subscriber Identity IMSI, and where the PDSN is identified by its Internet Protocol IP address.

17. A wireless network as in claim 14, where said MS detects that the MS has changed its location in the wireless network by receiving a sub-paging zone identifier with the MS, comparing the received sub-paging zone identifier with a previously received sub-paging zone identifier, and detecting that the MS has changed its location in the wireless network when the received sub-paging zone identifier does not match with the previously received sub-paging zone identifier.

18. A wireless network as in claim 14, where the information comprises a sub-paging zone identifier SPZ\_ID, a paging zone identifier PZID, and an Internet Protocol IP address of the PDSN.

19. A wireless network as in claim 18, where said AAA server is queried in response to an occurrence of a network initiated data session NIDS for the MS, and where said AAA server returns at least the SPZ\_ID, PZID and PDSN IP Address that are recorded for the MS.

20. A wireless network as in claim 15, where said MS detects that the MS has changed its location in the wireless network by receiving a sub-paging zone identifier with the

MS, comparing the received sub-paging zone identifier with a previously received sub-paging zone identifier, and detecting that the MS has changed its location in the wireless network when the received sub-paging zone identifier does not match with the previously received sub-paging zone identifier.

21. A wireless network as in claim 15, where the information comprises a sub-paging zone identifier SPZ\_ID, a paging zone identifier PZID, and an Internet Protocol IP address of a Packet Data Serving Node PDSN.

22. A wireless network as in claim 21, where said AAA server is queried in response to an occurrence of a network initiated data session NIDS for the MS, and where the AAA server returns at least the SPZ\_ID, PZID and PDSN IP Address that are recorded for the MS.

23. A Content Proxy Server having a network address and comprising a network interface, said Content Proxy Server further comprising a controller coupled to said network interface for receiving and storing data intended for a mobile station MS from a correspondent node CN, said Content Proxy Server operating to determine a current location of the MS and to initiate a Network Initiated Data Session NIDS for the MS at its current location.

24. A Content Proxy Server as in claim 23, where said controller determines the current location of the MS by issuing a query to an Authentication, Authorization and Accounting AAA server.

25. A Content Proxy Server as in claim 24, where said controller issues the query over a LDAP/SQL/JAVA interface to the AAA server.

26. A Content Proxy Server as in claim 24, where said controller receives a response to the query from the AAA server as a location tuple comprising a current Packet Data Serving Node PDSN IP address, a current paging zone identification PZID of the MS and a current sub-paging zone identification SPZ\_ID of the MS.

27. A Content Proxy Server as in claim 26, where the response to the query further comprises a static IP address of the MS.

28. A Content Proxy Server as in claim 26, where the response to the query further comprises the International Mobile Subscriber Identity IMSI of the MS.

29. A Content Proxy Server as in claim 24, where said controller forwards the stored data to the current PDSN reported in the location tuple.

30. A Content Proxy Server as in claim 27, where for the case where the response to the query further comprises the static IP address of the MS, said controller forwards the data to a Home Agent HA the PDSN IP Address, the PZID and the SPZ\_ID information, whereby the HA determines if there is a mobile IP association for the MS, and if there is the HA forwards the data to a corresponding PDSN, otherwise the HA forwards the data to the IP address of the PDSN reported in the location information.

31. A Content Proxy Server as in claim 24, where a Network Access Identifier NAI of the MS and an Internet Protocol IP address of the Content Proxy Server are sent to the CN from the MS, where the data sent from the CN to the Content Proxy Server includes the NAI, and where the query issued to the AAA server comprises the NAI.

32. A method to operate a wireless network with a mobile station MS, comprising:

registering the MS with a correspondent node CN;

sending data from the CN to a Content Proxy Server identified by the MS;

determining a current location of the MS with the Content Proxy Server; and

initiating a Network Initiated Data Session NIDS for the MS at its current location.

33. A method as in claim 32, further comprising, in response to the MS obtaining an IP address, routing the data from the Content Proxy Server to the MS at its current location.

34. A method as in claim 32, further comprising, in response to the MS obtaining an IP address, re-registering the MS with the CN, and sending the data from the CN to the MS at its current location.

35. A method as in claim 32, where registering comprises sending a Network Access Identifier NAI of the MS and an Internet Protocol IP address of the Content Proxy Server to the CN from the MS, where the data sent from the CN to the Content Proxy Server includes the NAI, and where the Content Proxy Server determines the current location of the MS by sending a query to a home Authentication, Authorization and Accounting AAA server, the query comprising the NAI.

36. A wireless network comprising a mobile station MS operable for registering the MS with a correspondent node CN, said wireless network further coupled to a Content Proxy Server, said CN sending data to said Content Proxy Server that is identified by the MS when registering with the CN, said Content Proxy Server operating to determine a current location of the MS and to initiate a Network Initiated Data Session NIDS for the MS at its current location.

37. A wireless network as in claim 36, where said Content Proxy Server is responsive to the MS obtaining an IP address for routing the data from the Content Proxy Server to the MS at its current location.

38. A wireless network as in claim 36, where the MS is responsive to obtaining an IP address for re-registering with the CN so that the CN sends the data to the MS at its current location.

39. A wireless network as in claim 36, where the MS when registering sends a Network Access Identifier NAI of the MS and an Internet Protocol IP address of the Content Proxy Server to the CN, where the data sent from the CN to the Content Proxy Server includes the NAI, and where the Content Proxy Server determines the current location of the MS by sending a query to a home Authentication, Authorization and Accounting AAA server, the query comprising the NAI.

40. A mobile station MS operable in a wireless network that comprises a base station BS, said MS comprising a transmitter for sending a registration request via the BS to a correspondent node CN, said wireless network being coupled to a Content Proxy Server, said CN sending data to said Content Proxy Server that is identified by the MS when sending the registration request to the CN, said Content Proxy Server operating to determine a current location of the MS and to initiate a Network Initiated Data Session NIDS for the MS at its current location, said MS further comprising a receiver to receive data sourced by the CN, via the BS, at its current location.

41. A MS as in claim 40, where said Content Proxy Server is responsive to the MS obtaining an IP address for routing the data from the Content Proxy Server to the MS at its current location.

42. A MS as in claim 40, where the MS is responsive to obtaining an IP address for re-registering with the CN so that the CN sends the data to the MS at its current location.

43. A MS as in claim 40, where the MS, when sending the registration request, sends a Network Access Identifier NAI of the MS and an Internet Protocol IP address of the Content Proxy Server to the CN, where the data sent from the CN to the Content Proxy Server includes the NAI, and where the Content Proxy Server determines the current location of the MS by sending a query to a home Authentication, Authorization and Accounting AAA server, the query comprising the NAI.

44. A base station BS operable in a wireless network comprising a mobile station MS, said BS comprising a receiver for receiving a registration request from the MS for a correspondent node CN, said wireless network being coupled to a Content Proxy Server, said CN sending data to said Content Proxy Server that is identified by the MS when sending the registration request to the CN, said Content Proxy Server operating to determine a current location of the MS and to initiate a Network Initiated Data Session NIDS for the MS at its current location, said BS further comprising a transmitter to transmit data sourced by the CN to the MS at its current location.

45. A BS as in claim 44, where said Content Proxy Server is responsive to the MS obtaining an IP address for routing the data from the Content Proxy Server to the MS at



its current location, via the BS.

46. A BS as in claim 44, where the MS is responsive to obtaining an IP address for re-registering with the CN so that the CN sends the data to the MS at its current location via the BS.

47. A BS as in claim 44, where the MS, when sending the registration request, sends a Network Access Identifier NAI of the MS and an Internet Protocol IP address of the Content Proxy Server to the CN, where the data sent from the CN to the Content Proxy Server includes the NAI, and where the Content Proxy Server determines the current location of the MS by sending a query to a home Authentication, Authorization and Accounting AAA server, the query comprising the NAI.